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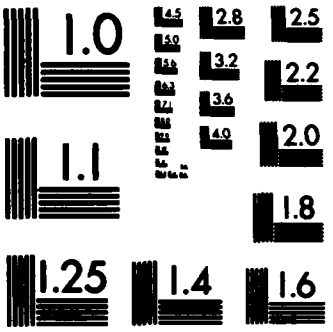

Development of Generic Mobility-Terrain Data Bases; Investigation of Critical Soil Parameters

Interim Technical Report

by

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According to the proposed research work on "Development of Generic Mobility-Terrain Data Bases, Validation Procedures and Investigation of Critical Soil Parameters" some basic results have been achieved by August 1983:

Generic mobility-terrain data bases

For two regions in West Germany - which resulted from the WES topographic and climatic terrain regionalization - extensive ground truth testing was performed in order to evaluate the relative degrees of similarity of two or more terrain patches with respect to ground mobility conditions. Terrain "cells" of 10 x 10 km size were selected all over Germany for this test purpose and regional consistency of subregions and the particular cells investigated were examined. This was based on the assessment of severity of effect on ground mobility of a Leopard tank (no, little, medium, severe influence, no go). In addition to that, primary and secondary terrain factors and their resulting mobility impediments were determined at various sample locations within the cells. The basic topografic regions of investigation were

- Rhine River Valley and the Northern Plains
- Central Highlands

A total amount of 40 cells were visited within these regions during October/November 1982. Cell selection by a χ^2-criterion proved to be in good accordance with the regional characteristics of the subregions examined. Within a second phase to be performed later, additional validation efforts ought to be concentrated on selected areas. This will allow possible adjustments and a final assessment of the generic modeling method for West German terrain conditions.

Validation Procedures

Field investigations in August/September 1982 have revealed that mobility-terrain factor mapping for a tracked (M 60) and wheeled (M 813) vehicle provided satisfactory results for those areas critical to mobility. Sources of error were identified as being mainly due to extensive reallocation and consolidation of arable land and pastures. A sufficient updating capability within the terrain modeling routines will take care of such problems and keep away major errors. The German crop rotation system needs to be regarded while undergoing further validation efforts; seasonal changes of agricultural land-use characteristics may influence the performance of wheeled vehicles quite considerably (visibility, ride).

Critical Soil Parameters

Within the regions investigated for the generic modeling about 30 sites were selected within potentially wet areas for CH, CL, MH, ML and organic soil sites. Selection was based on 1:25.000 scale soil maps, 1:200.000 soil site condition maps as well as site visits.

It is planned to perform direct shear tests for wet soil and dry season conditions during the next phase of the research project. These will yield soil parameters like C, ϕ, G as well as moisture content, grain-size distribution, plasticity limits, CI and RI values.

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